

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SITE CLEANUP ORDER NUMBER 91-020

FMC CORPORATION, GROUND SYSTEMS DIVISION FOR THE PROPERTY LOCATED AT:

333 WEST BROKAW ROAD
SANTA CLARA
SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board) finds that:

1. SITE DESCRIPTION FMC Corporation (FMC) presently owns and occupies an approximate 25 acre property located at 333 West Brokaw Road, Santa Clara, Santa Clara County (the Site), Figure 1, Appendix D.
2. SITE HISTORY Land use in the area was primarily agricultural before the early 1950s. Federal Pacific Electric, now Reliance Electric, is the previous owner of approximately 17 acres of the site and manufactured and tested electrical transformers between 1956 and 1968. FMC purchased 75% of the 17 acre parcel from Reliance in 1964, and the complement of the 17 acres in 1968. FMC purchased an adjoining 8 acre parcel from the City of Santa Clara in 1979. Primary site use by FMC is and has been for military tracked vehicle assembly and storage, parts receiving, warehousing, and other manufacturing activities.
3. REGULATORY STATUS FMC is a discharger because of their ownership and occupancy of the site from 1964 to present. Since 1964, releases of chemicals to the soil and eventually the groundwater have polluted the site. FMC voluntarily began soil and groundwater pollutant characterization work in 1989. FMC has assumed initial responsibility for site investigations, formulating alternative cleanup proposals and initiating site remediation.

Regional Board staff is in communication with Reliance Electric to establish Reliance's site use history and appraise their contribution, if any, to the site pollution. At some time in the future, Regional Board staff may add Reliance Electric to the Order as a discharger.

4. HYDROGEOLOGY Sediments underlying the Site include marine clays and fluvial deposits. First-encountered groundwater 25 feet deep, the A-aquifer, is in interbedded silty clay, sand and gravel to a depth of about 38 to 53 feet. Second-encountered groundwater, the B-aquifer, is composed of silty clay to sandy silt interbedded with moderately-graded fine-grained sands, pebbles and cobbles. The B-aquifer is between 70 and 93 feet below the ground surface and is separated from the A-aquifer by a 10 to 20 foot thick silty clay sequence.

Groundwater flows east and northeasterly in the A- and B-aquifers. Fluctuations in shallow groundwater levels have been observed. Aquifers which serve as drinking water supplies exist at depths 300 to 900 feet below ground surface.

5. SOIL AND GROUNDWATER INVESTIGATIONS Subsurface soil investigations were performed in 1989 through 1990 with 70 soil borings and 61 soil vapor extraction points to detect the presence of petroleum hydrocarbons and volatile organic compounds (VOCs).

VOC soil pollutant concentrations were as high as 3.6 ppm for trichloroethene (TCE), 1.1 ppm for toluene, 0.57 ppm for tetrachloroethene (PCE), 0.26 ppm for 1,1-dichloroethane (1,1-DCA) and 0.2 ppm for 1,1,1-trichloroethane (1,1,1-TCA). Polychlorinated biphenyls (PCBs) were detected near the surface in concentrations as high as 15,000 ppm. Total petroleum hydrocarbon concentrations in the soil were detected as high as 18,000 ppm.

Twenty-five monitoring wells have been installed at the site. Nineteen monitoring wells screen the A-level aquifer 38 to 53 feet in depth and six monitoring wells screen the B-level aquifer 70 to 93 feet in depth.

Groundwater pollution has been detected in several A-aquifer wells with concentrations as high as 0.63 ppm for TCE, 0.19 ppm for 1,1,1-TCA and 0.003 ppm for cis-1,2-dichloroethene (cis-1,2-DCE). No groundwater pollution has been detected in the deeper B-level aquifer.

FMC submitted a letter report "Preliminary Environmental Assessment Findings, 333 W. Brokaw Road, FMC Corporation - Ground Systems Division, Santa Clara, Santa Clara County, California, May 31, 1990", which summarizes all environmental assessment work performed by FMC from 1989 to date. In addition, the FMC submitted on November 19, 1990, a Sampling and Analysis Plan to monitor groundwater at the site, a brief Site Use History Report and a Technical Report Workplan for additional soil and groundwater characterization. Board staff has reviewed these documents and finds them satisfactory.

6. SCOPE OF THIS ORDER This order contains tasks for further site investigation, and implementation and evaluation of final remedial actions. These tasks are necessary to alleviate the threat to the environment posed by soil pollution and migration of any groundwater pollution, and to provide a substantive technical basis for designing and evaluating the effectiveness of final cleanup alternatives.
7. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives and beneficial uses for South San Francisco Bay and contiguous surface and groundwaters.
8. The existing and potential beneficial uses of the groundwater underlying and adjacent to the facility include:

- a. Industrial process water supply
 - b. Industrial service water supply
 - c. Municipal and Domestic water supply
 - d. Agricultural water supply
9. The discharger has caused or permitted, and threatens to cause or permit waste to be discharged or deposited where it is or probably will be discharged to waters of the State and create or threaten to create a condition of pollution or nuisance.
 10. This action is an order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of the CEQA pursuant to Section 15321 of the Resources Agency Guidelines.
 11. The Board has notified the discharger and interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharge and has provided them with the opportunity for a public hearing and an opportunity to submit their written views and recommendations.
 12. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger, its agents, successors, and assigns, shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State is prohibited.
2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.
3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of pollutants are prohibited.

B. SPECIFICATIONS

1. The storage, handling, treatment or disposal of soil or groundwater containing pollutants shall not create a nuisance as defined in Section 13050(m) of the California Water Code.
2. The discharger shall conduct site investigations and monitoring activities as needed to further define the current local hydrogeologic conditions, and the lateral and vertical extent of soil and groundwater pollution. Should monitoring results show evidence of pollutant migration, additional characterization of pollutant extent may be required.

3. The cleanup goal for source-area soil is 1 ppm for total VOCs. Alternate cleanup goals may be proposed based on site specific data. If higher levels of VOCs are proposed, the discharger must demonstrate that cleanup to 1 ppm total VOCs is infeasible, that the alternate levels will not threaten the quality of waters of the State, and that human health and the environment are protected. Additionally, if any chemicals regulated under this Order (or their degradation products) are left in the soil above proposed cleanup levels, a program of continued groundwater monitoring may be required. Final cleanup goals for source-area soils will be approved by the Board.
4. Final cleanup goals for polluted groundwater, onsite and offsite, shall be in accordance with State Water Resources Control Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California. Proposed final cleanup levels shall be based on a feasibility study of remedial alternatives that compare cost, effectiveness and time to achieve cleanup goals. Cleanup levels shall also have the goal of reducing the mobility, toxicity, and volume of pollutants. Final cleanup levels shall be approved by the Regional Board.
5. If groundwater treatment is necessary and extraction and treatment is considered as an alternative, the feasibility of water reuse, reinjection, and disposal to the sanitary sewer must be evaluated. Based on the Regional Board Resolution 88-160, the discharger shall optimize, with a goal of 100%, the reclamation or reuse of groundwater extracted as a result of cleanup activities. The discharger shall not be found in violation of this Order if documented factors beyond the discharger's control prevent the dischargers from attaining this goal, provided the discharger has made a good faith effort to attain this goal. If reuse or reinjection is part of a proposed alternative, an application for Waste Discharge Requirements may be required. If discharge to waters of the State is part of a proposed alternative, an application for an NPDES permit must be completed and submitted, and must include the evaluation of the feasibility of water re-use, reinjection, and disposal to the sanitary sewer.

C. PROVISIONS

1. The discharger shall comply with the Prohibitions and Specifications above, in accordance with the following time schedule and tasks:

TASKS AND COMPLETION DATES

a. **TASK:** **REMEDIAL INVESTIGATION REPORT**

Submit a technical report acceptable to the Executive Officer that presents data and results from site assessment work performed at the site as proposed in the accepted workplan referenced in Finding 5. This report may include, but shall not be limited to, results from soil vapor survey, soil boring and groundwater investigations. The technical report shall also include any proposals for interim remedial actions, an implementation schedule and report submittal date for implemented interim remedial actions.

COMPLETION DATE: April 30, 1991

b. TASK: REPORT ON REMEDIAL ALTERNATIVES AND PROPOSAL OF FINAL CLEANUP STANDARDS AND ACTIONS

Submit a technical report acceptable to the Executive Officer that proposes final cleanup standards and actions for Site soil and groundwater pollution. This report shall include: 1) a summary of results of the remedial investigations; 2) a feasibility study evaluating alternative final remedial measures; 3) the recommended measures necessary to achieve proposed final cleanup standards, and; 4) the tasks and schedule necessary to implement the recommended final remedial measures.

This report shall also include a completed NPDES permit application if groundwater extraction with surface water discharge is part of a proposed final remedial action. The application shall include an evaluation of water reuse pursuant to Specification B.5.

COMPLETION DATE: August 31, 1991

c. TASK: COMPLETE IMPLEMENTATION OF FINAL CLEANUP ACTIONS

Submit a technical report acceptable to the Executive Officer documenting the implementation of final cleanup actions in accordance with Task C.1.b. above as proposed and approved by the Board pursuant to Specifications B.3 and B.4.

COMPLETION DATE: 120 days after implementation of the actions as proposed and accepted by the Regional Board in accordance with Provision C.1.b.

d. TASK: SUBMIT FIVE YEAR STATUS REPORT

Submit a technical report acceptable to the Executive Officer containing the following:

1. the results of any additional investigative work completed,
2. an evaluation of the effectiveness of installed final cleanup measures,
3. additional measures to achieve final cleanup standards, if necessary,
4. a comparison of previously estimated costs with actual costs incurred and a revised projection of costs necessary to achieve final cleanup standards,
5. the tasks and time schedule necessary to implement any additional final cleanup measures,
6. recommended measures for reducing Board oversight activities,
7. describe the reuse of extracted groundwater, if any,
8. evaluate and document the removal and/or cleanup of polluted soils, and groundwater.

If final cleanup standards have not been achieved through the implementation of the approved groundwater and soil remediation plans, this report shall also contain an evaluation addressing whether it is technically feasible to achieve these standards with the approved remedial measures, and if not, contain a proposal for procedures to do so.

COMPLETION DATE: February 20, 1996.

2. The submittal of technical reports evaluating interim and final remedial measures will include a projection of the cost, effectiveness, benefits, and impact on public health, welfare, and environment of each alternative measure. The remedial investigation and feasibility study shall consider the guidance provided by Subpart E of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300), March, 1990; Section 25356.1 (c) of the California Health and Safety Code; US EPA "Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA", or any subsequent CERCLA guidance documents with reference to Remedial Investigation, Feasibility Studies, and Removal Actions; and the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".
3. If the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the discharger shall promptly notify the Executive Officer.
4. The discharger shall submit to the Regional Board acceptable reports on compliance with the requirements of this Order, and acceptable activity monitoring reports that contain descriptions and results of work performed. These reports are to be submitted according to a program prescribed by the Regional Board and outlined below.
 - a. **ON A MONTHLY BASIS**, for a period of one year after the first monthly report of this Order, technical reports on the status of compliance with this Order shall be submitted to the Board, commencing in March, 1991, and due on the last day of each following month. Each report may be in a letter format covering the previous month and shall include, but is not limited to, the following:
 - 1) Summary of work completed since submittal of the previous report, and work projected to be completed by the time of the next report.
 - 2) Identification of any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles.
 - 3) Written notification which clarifies the reasons for non-compliance with any requirement of this Order, and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order.

b. **ON A QUARTERLY BASIS**, technical compliance reports on groundwater monitoring shall be submitted to the Board, commencing with the April through June calendar quarter. The quarterly reports shall be submitted 30 days after the end of the previous quarter and may include the monthly report due concurrently, beginning with the June, 1991 monthly report included in the quarterly report due on July 31, 1991. The quarterly reports shall include, but need not be limited to, the following information:

- 1) Tabulated and cumulative analytical results of quarterly groundwater quality sampling analyses for all monitoring wells specified in the monitoring program with updated groundwater pollution plume maps.
- 2) Updated potentiometric surface maps, based on the most recent quarterly water level measurements for all affected water bearing zones monitored by onsite and offsite wells.
- 3) A cumulative tabulation of volume of extracted groundwater, quarterly analysis results for all groundwater extraction wells, and estimates of pounds of chemicals removed.
- 4) Updated well construction details for any additional wells that have been installed during the quarter.
- 5) Updated or revised reference diagrams including geologic cross-sections and appropriately scaled and detailed base maps showing the location of all monitoring wells and extraction wells, and identifying adjacent facilities and structures.
- 6) Identification and notification of non-compliance with groundwater monitoring requirements of this Order, as described in Provisions 4.a.2. and 4.a.3.

c. **ON AN ANNUAL BASIS**, technical reports on the progress of compliance with all requirements of this Order shall be submitted to the Board, commencing with the report due January, 1992, and covering the previous year. Annual reports may include any monitoring reports due concurrently. The progress reports shall include, but need not be limited to, progress on the site investigation and remedial actions, operation of final remedial actions and/or systems, and the feasibility of meeting groundwater and soil cleanup standards.

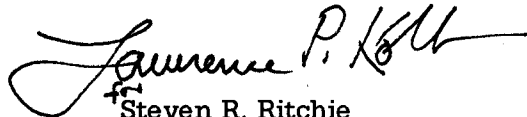
5. All hydrogeological plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist or professional engineer, or a certified engineering geologist.
6. All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain Quality Assurance/Quality Control records for Board review.
7. The discharger shall maintain in good working order, and operate, as efficiently as possible, any facility or control system installed to achieve compliance with the requirements of this Order.

8. a. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order shall be provided to the following agencies:
 - 1) Regional Water Quality Control Board (1 copy, Steve Ritchie)
 - 2) Santa Clara Valley Water District (1 copy, Tom Iwamura)
b. The dischargers shall provide copies of cover letters, title page, table of contents and summaries of above compliance reports - except for the annual progress reports and the report on remedial alternatives and proposal of final cleanup standards and actions - which shall be submitted in full to the following agencies:
 - 3) Santa Clara County Health Department (Lee Esquibel)
 - 4) City of Santa Clara Fire Department (David Parker)
 - 5) Department of Health Services/TSCD (Howard Hatayama)
9. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:
 - a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the terms and conditions of this Order.
 - c. Inspection of any monitoring equipment or methodology implemented in response to this Order.
 - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.
10. The discharger shall file a report on any changes in Site occupancy and ownership associated with the facility described in this Order.
11. If any hazardous substance is discharged in or on any waters of the state, or discharged and deposited where it is, or probably will be discharged in or on any waters of the state, the discharger shall report such discharge to this Regional Board, at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-business hours. A written report shall be filed with the Regional Board within five (5) working days and shall

contain information relative to: the nature of waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control, and Countermeasure Plan (SPCC) in effect, if any, estimated size of affected area, nature of effect, corrective measures that have been taken or planned, and a schedule of these activities, and persons/agencies notified.

12. The Board will review this Order periodically and may revise the requirements when necessary.

I, Steven R. Ritchie, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on February 20, 1991.

A handwritten signature in dark ink, appearing to read "Steven R. Ritchie", with a stylized flourish extending to the right.

Steven R. Ritchie
Executive Officer